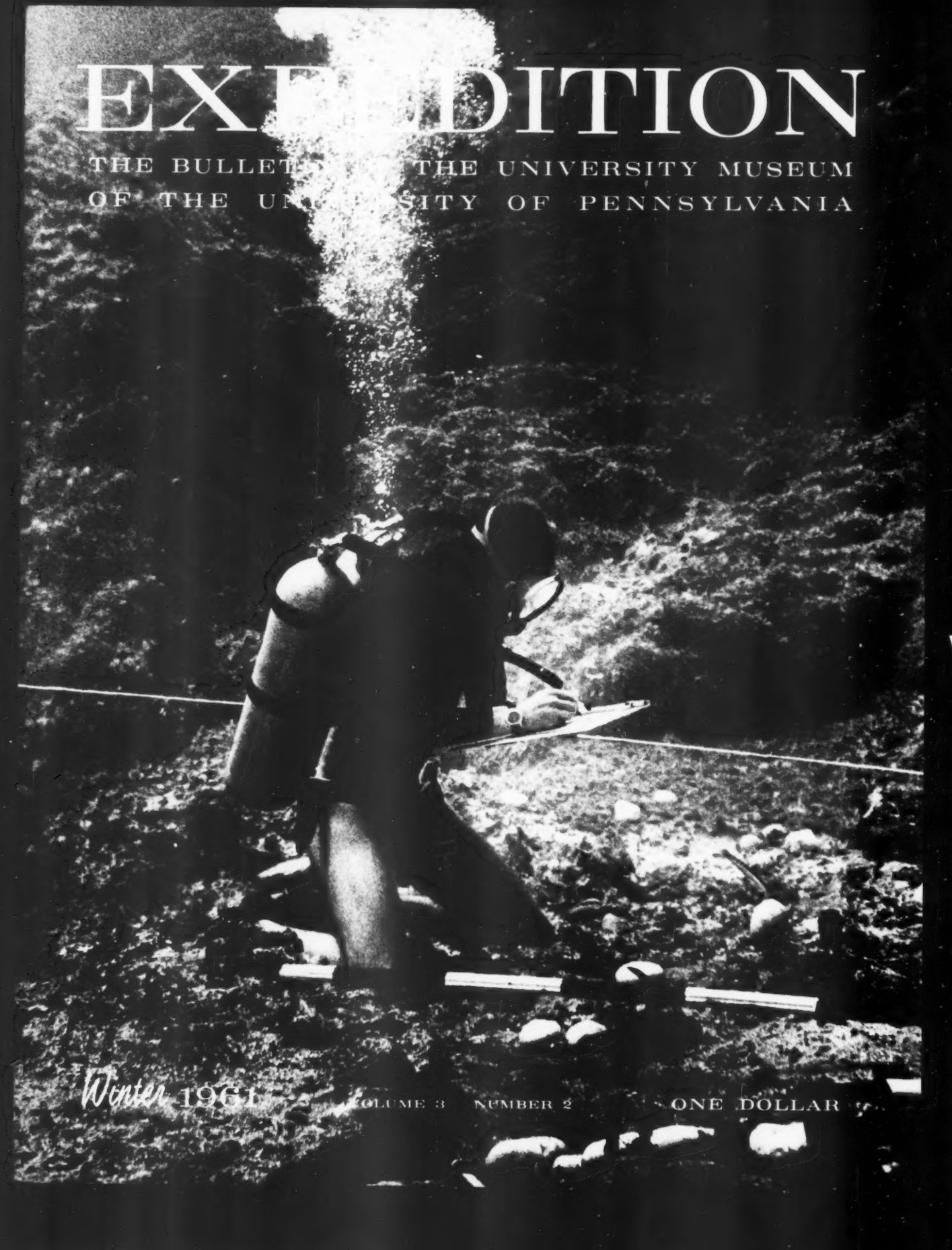
EXPEDITION

THE BULLETIN OF THE UNIVERSITY MUSEUM
OF THE UNIVERSITY OF PENNSYLVANIA



Winter 1961 VOLUME 3 NUMBER 2 ONE DOLLAR

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(Cover) Drawing with a pencil on frosted plastic, Claude Duthuit plots the position of some of the small objects on the wreck of a Bronze Age ship preparatory to removing them for study. This was one of the methods of land archaeology adapted in this first season to under-sea investigation. The story of this expedition begins on page 2.

CREDITS

PHOTOGRAPHS

A BRONZE AGE SHIPWRECK: By Peter Throckmorton, Herb Greer, and Peter Dorrell. FOOTNOTE ON GRIFFINS: By Kendall S. Kleindienst. BETH SHAN: By Palestine Expedition and Kendall S. Kleindienst. FLORA OF TIKAL: By Julio Jadik except page 6, upper right, by Ed. Miley.

MAPS AND DRAWING ON PAGE 34: By A. Eric Parkinson.

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EXPEDITION

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A Bronze Age Shipwreck

By GEORGE F. BASS

Just off Cape Gelidonya, on the southwest coast of Turkey, lies a row of five tiny islands, little more than rocky peaks on the sea and dots on a map. Sometime during the fourteenth or thirteenth century B.C. a small merchant ship tried to pass between two of these islands and, perhaps cracking against the jagged rocks during a stormy night, sank in ninety feet of water. As undisturbed as any ancient tomb or buried city, the ship lay, slowly disintegrating on the rocky bottom.

In 1958 Peter Throckmorton, a photo-journalist from New York, arrived in Bodrum, the sponge center of Turkey. Keenly interested in locating and charting ancient wrecks along the coast, he used his talents as a photographer and diver while working with the local sponge divers. For two summers he sailed on Mandalinci, *a local sponge boat, questioning the captain, Kemal Arras, and other divers about what they had seen underwater. They showed him many wrecks and told him of many more. One of these was the ship off Gelidonya. By 1959 he had been able to dive on the wreck and recognized some of the objects on the sea-bed as being of the Late Bronze Age.*

Realizing the importance of such a find he contacted the Council for Underwater Archaeology in San Francisco, which immediately inquired of the University Museum if it would be interested in organizing an expedition. Could there possibly have been any doubt! This would be the first scientific excavation to bring the precise methods of land archaeology to the bottom of the sea. And even more exciting, the excavation would be of by far the oldest shipwreck ever found. I was sent to the local YMCA to learn to dive.

Shortly thereafter Frederic Dumas, co-author of The Silent World, *agreed to take leave from his post with the French Navy's Undersea Research Group to be our chief diver, and Miss Joan du Plat Taylor joined us as the representative of the London Institute of Archaeology, which handled the preservation of the finds. Other supporters were the Council for Underwater Archaeology, the Littauer Foundation, Mr. Nixon Griffis of New York, and the American Philosophical Society.*

By April, I was in Istanbul with Mr. Throckmorton and Claude Duthuit, a French diver. A revolution was the least of our worries! How does one explain an eighteen-foot-long crate, containing parts for an air-lift and an underwater drafting frame, to a Customs official? Or a core-sampler for taking underwater soil samples? Or locate a misplaced recompression chamber? Or move a three-ton air-compressor from Ankara to roadless Cape Gelidonya?

Somehow most of these problems were solved and on June third we sent a cable to Dr. Rodney Young at the University Museum, saying that we had our permit and all equipment. From that time on, excerpts of letters to Dr. Young may best recall our feelings and describe our work:

NEAR FINIKE, JUNE 19, 1960

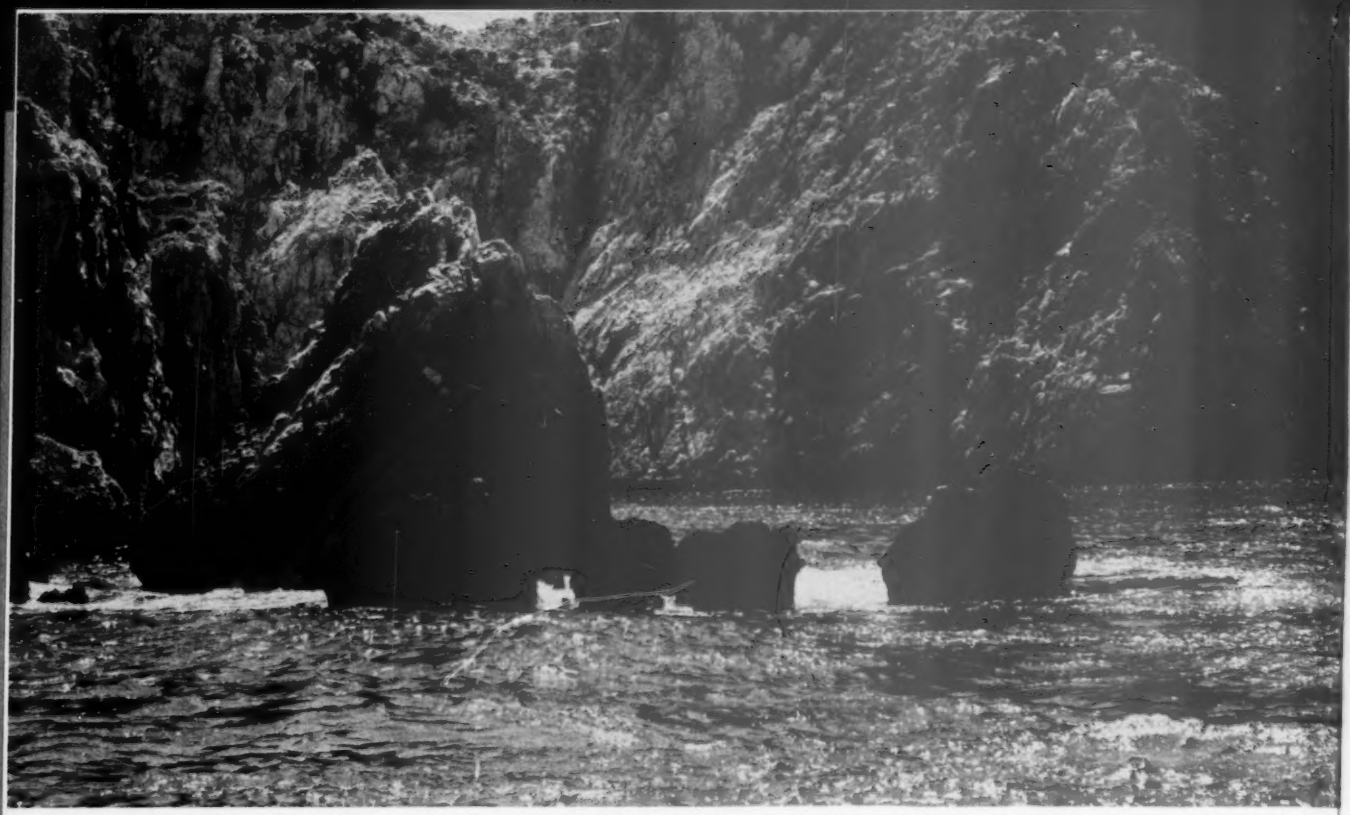
I came on to Finike with Miss Taylor and Miss Frost on the two boats, while Dumas and Peter and Hakki Bey came overland in the jeep (three days to our one and a half). We made final preparations in Finike and then had to wait for a few days because of bad weather. Finally we came out and spent half a day looking for a camp site. We found one about forty-five minutes to an hour away from the wreck on a NARROW beach that has cliffs on all sides and no way out. The stones fall from the cliff during the night and I am sure we will all be covered by a landslide, but at least there is fresh water. We dammed up a little trickle from the rocks and made quite a nice basin of fresh water for Miss Taylor to wash bronzes in. We are also making good use of a company tent, twenty-two mattresses, an electric generator, thirty pieces of canvas, etc., etc., (including two parachutes) that we conned out of the army. I will send a picture.

On the first day after we were here I stayed with Duthuit and Greer and helped organize the camp while Peter and Dumas went out to the wreck. They found it immediately. The next morning I went down to look at the wreck (ninety feet) with Dumas and Duthuit. Dumas also took Hakki Bey down, the first time that he had used an Aqua-lung. I have had no trouble with the diving and have been able to work underwater with the rest.

> *At first we were terribly disappointed as it appeared that some things had been removed and that there was little left:*

But now the big news. This morning Miss Frost and Dumas went for a simple exploratory dive and returned with good news. He knocked off the corner of a large "platform" on which most of the loose stuff was lying and found that it was solid bronze to quite a way down. Then he moved into an area nearby, in a gulley, where we think we have the stone anchor, and found that again there is a tremendously thick deposit of bronze material, including whole ingots and tools and the like. He estimated it as at least a ton of material. So it looks like the Byzantine wreck must wait for another year, as we cannot get the things loose easily. Is this not the largest hoard of Bronze Age bronzes yet found?

"The stones fall from the cliff during the night and I am sure we will all be covered by a landslide, but at least there is fresh water."



". . . the island against which the poor ship came to grief."

However, we were only beginning. We experimented with photography:

Dumas got the idea of outlining the edges of the important areas of the wreck with large white beach stones, which show up very well in photographs. Now, Peter and Duthuit are off making an underwater "aerial survey" of the area with ropes and meter sticks and levels and compasses. When they have enough pictures, we will be able to overlap them and make a good plan from which to label objects, etc. We have already lifted several ingots and a whole pot from the bottom, because they were scattered.

Three days later I was able to cable from Finike:

JUNE 22, 1960

TONS CARGO HULL MAYBE SAILS PRESERVED SEVERAL YEARS JOB

My enthusiasm was explained in a letter written back at camp that night:

The interesting part is the wreck. We found timbers under one section, so hope to get part of the hull. The cloth that I thought might be sails turned out to be reed matting, and was probably a basket holding part of the cargo. There will be many more ingots and so far we have gotten several distinct types which have various marks on them. The tools are quite similar to the ones found last year, but there are new things, including a handful of bronze nails. Most of the wreck is so concreted with sea deposits that we are going to try to raise large chunks of concretion with a boom on the ship and chip the pieces out on land. We now have a fairly good map of the area and are beginning to work in small areas at a time.

The diving itself is not too bad. It is rather tense work, however, and I think that people are less likely to be in a friendly mood after a dive. Our decompression chamber is still in customs and I, for one, do not enjoy the first hour after a long dive waiting to see if I shall come up with a case of bends. We are now making two dives a day when possible. We take lunch with us and either eat on the boat or row over to the island against which the poor ship came to grief.

JUNE 27, 1960

The wreck seems to have been a junk ship, carrying a load of old metal objects. Although we are getting many different kinds of copper ingots and spear-points and agricultural tools, most of them seem to have been already broken when the ship was sailing (we do have quite a bit of evidence to prove that the things were not broken during the sinking of the ship). A great quantity of the cargo was just plain pieces of broken ingots. These pieces were either wrapped in baskets or, less likely, were lying on a woven mat over the deck.

The ship, itself, has been more-or-less outlined now by exploratory dives. Dumas and Duthuit then put white beach stones around the great mass of cargo, which seems to indicate the limits of the ship. The size of the ship and its cargo varies from day to day—underwater it is almost impossible to tell the difference between concreted cargo and stone without chipping it open —with Dumas' present estimate being about a ton of bronze. A piece of well-preserved wood under the thickest mass of material (which has not been touched) has given us hopes that some of the hull will be well preserved. If it is, it will be in fine condition as pieces of twigs in the basket still preserve their bark.

We are now working in this manner. We have an overall plan of the area and also a photographic overlay of most of the area. We have labeled the conspicuous objects which must be lifted and these are plotted on the plans. Then we go down with a draftsman and tie numbered plastic labels on the things I want lifted. These are then put into a steel-wire basket and lifted with the hoist on the boat. So far most of the lifting has been of loose ingots and objects. To get into the heart of the ship will be a different matter. We have tried loosening objects underwater and have made sets of chisels, crowbars, mason's hammers and the like. But underwater there is simply not enough time and it is easier to break something than on land. Therefore we have decided to try to raise one piece all at once. To break it loose Dumas and Duthuit have been picking under the concretion, but it would take them months to loosen a very small section of just one area of the ship. Tomorrow, at Peter's suggestion, they will try to use a car jack to break it loose.

If you see a large case, looking like the end of a torpedo, floating past your house, grab it. It's our Polaroid camera. After all the troubles we've had getting it to France, having the case specially

"Sometimes we raised lumps with plastic balloons."

"We now have a fairly good map of the area . . ."

"We are going to try to raise large chunks of concretion with a boom on the ship and chip the pieces out on land."

"We now have about sixteen ingots of various types, with more to come."

"The diving itself is not too bad. It is rather tense work, however, and I think that people are less likely to be in a friendly mood after a dive."

built, finding the lost film in Greece, etc., it was weighted perfectly so that it would stay at one level in the water. Today, the diver using it got water in his tubes and surfaced rapidly, leaving the Polaroid floating about eighty feet down. The current moved it away and even the sponge-divers joined in the search, but it is probably on its way to Italy by now.

A week later we got our first taste of worse things to come:

JUNE 29, 1960

If this letter reaches you in a bottle, fear for the worst. Our little beach is only about twenty feet wide and the south wind, which Kemal says never comes in summer, came today. We had wet feet eating supper, and if the waves rise the slightest bit more, we will be floating out of here.

The work continues to be interesting. Today we got a jack under a large hunk of unintelligible concretion and cracked it loose. We then raised it with a cable and winch on the ship. After a bit of chiseling it turned out to be a stack of at least six, and maybe more, ingots of various shapes. Between two of the ingots a basket had been crushed, with rope and matting perfectly preserved. Under this platform is another pile of ingots, but between the two sections is a hollow dome which I wanted well drawn and photographed before moving more; it may contain the shape of the ship before some wood in this area rotted away. But it is too early to say.

Our food is now quite good. I will send a boat to Antalya every week if at all possible. I went the other day to get some medicine and take the compressor in for an overhaul and found out that they have every kind of fresh fruit and vegetables imaginable. Finike simply could not support us without a refrigerator. We lived on tomatoes and cucumbers for a week, with a little cheese, olives, and bread, and had meat once and yogurt once. The only other protein we had was the fish that we could spear during the evening. The whole crew was getting pretty weak, for diving really takes it out of you, and I think that is why I came down with some bug. As a matter of fact, I am going to send the whole crew into Antalya this weekend for a day, for we have worked steadily for over two weeks without a single morning's break. I think that a day off every two weeks would be a good thing, although most of us want to keep working every day now that we have so little time left and there is the very real fear that someone else will come and tear up the rest of the ship if we do not finish the job.

Most of us did go into Antalya for the weekend, but that was the last time. The next time we stopped working for a day was on September thirteenth, the day we broke camp and left the site. One of our headaches was mechanical:

JULY 6, 1960

Compressor trouble is killing us. One still remains in customs, with Hakki Bey there now working to get it out. Our big compressor is still not working, but will fill the tanks enough for short dives. Peter's old compressor is in Antalya at the mechanic's. Luckily two Germans and an American arrived the other day and asked to work with us for a week and they have a small compressor which is good for a few tanks a day, which is a help.

Yesterday I had Duthuit and Wlady, one of the German boys, chip loose a piece of concretion that had a wooden "handle" in it and the other side turned out to be filled with hundreds (if not thousands) of glass beads of various types, which are evidently part of the trading material. This shows that there is more stuff than just bronze and I am wondering if this was some of the stuff that was being traded for (or used to trade with).

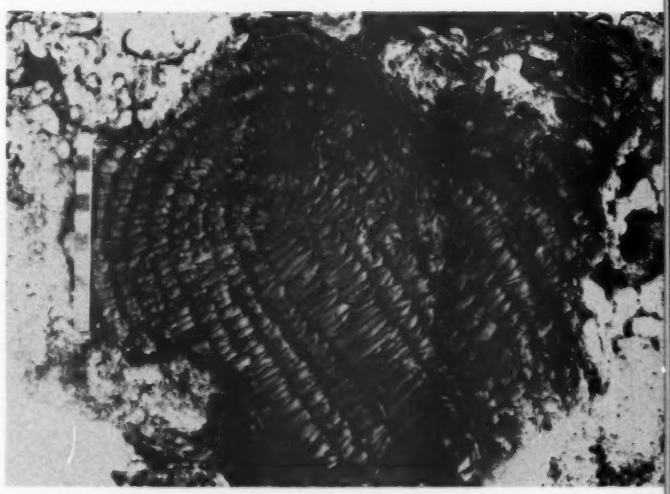
JULY 7, 1960

We still have not got down to the wood which sticks out of the bottom of part of the cargo, but I am still assuming it is part of the hull. We have raised about half a ton of bronze and the greater part of the ship remains. I think that we can finish this season and we all feel that we must if we want it preserved. Some of the pikes have marks on them; many, if not most, of the ingots also have letters. We now have about sixteen ingots of various types, with more to come. Mixed in with every load we raise are pieces of sticks and twigs with the bark still on, so they were obviously not part of the hull. This had us all puzzled, but I started taking Homer out with me on the boat and some of us read through, looking for ship references. Peter found a description of a ship being built that mentions a grill of twigs being built around the deck to keep the heavy seas out.

The dreadful July current is truly bad. Today both my fins were pulled off and I must now tie them on with rubber straps, but we must continue to work here. We MUST finish the job this year, for the local press has already come out with an article that the ship is full of gold and

"I will send a boat to Antalya every week."

" . . . the wood which sticks out of the bottom of part of the cargo."



"Between two of the ingots a basket had been crushed, with rope and matting perfectly preserved."

"Numbered objects are put into a steel wire basket and lifted with the hoist on the boat."

"Rigged up air-lift today with Kemal's compressor and it works like a feather duster."

"Peter rigged up hoses and we were able to dive with these."

it is quite evident that even some of our sponge divers believe this to be true. Kemal says that a rich man from Izmir came to Bodrum and offered him a large sum of money to take him to the wreck.

In the afternoon there was little current, so we did a good job, but in the morning it was so strong that it was hard. I took Kemal down for the first time to show him what we were doing, so that he can have his men help us, and I had to swim upstream like mad every time I let go a rock and grab another one to hold on. I even saw a fish being swept sideways until he could straighten around and face the current.

Traces of wood and woven material still were somewhat confusing:

JULY 14, 1960

Only a very short note to let you know that I was very discouraged when the wood we thought was hull turned out to be otherwise, but yesterday we uncovered much more of it and if it is not the planks of the ship I will eat my Aqualung. I stopped all diving today to give a chance to work on camera flash-attachments, air-lifts, drawings, etc., for the recording of the wood will be as difficult as it is important.

The air-lift was a large tube which, working with air pumped from the surface, acted like a giant vacuum-cleaner. It was used for removing sand:

JULY 15, 1960

Rigged up air-lift today with Kemal's compressor and it works like a feather duster. With it they found a small pocket of sand containing a set of small "apothecary's weights" (one of lead), a "snake-headed" bracelet, a complete axe, and a whole chisel. All in nearly perfect condition. It seems that the sand layer under the crust may contain better preserved objects.

Near this pocket, Wlady Illing found our prize object to that time:

JULY 19, 1960

FINE SYRIAN CYLINDER SEAL

Shortly thereafter, all of our air-compressors died and we were no longer able to fill our Aqua-lungs. Peter rigged up two hoses to

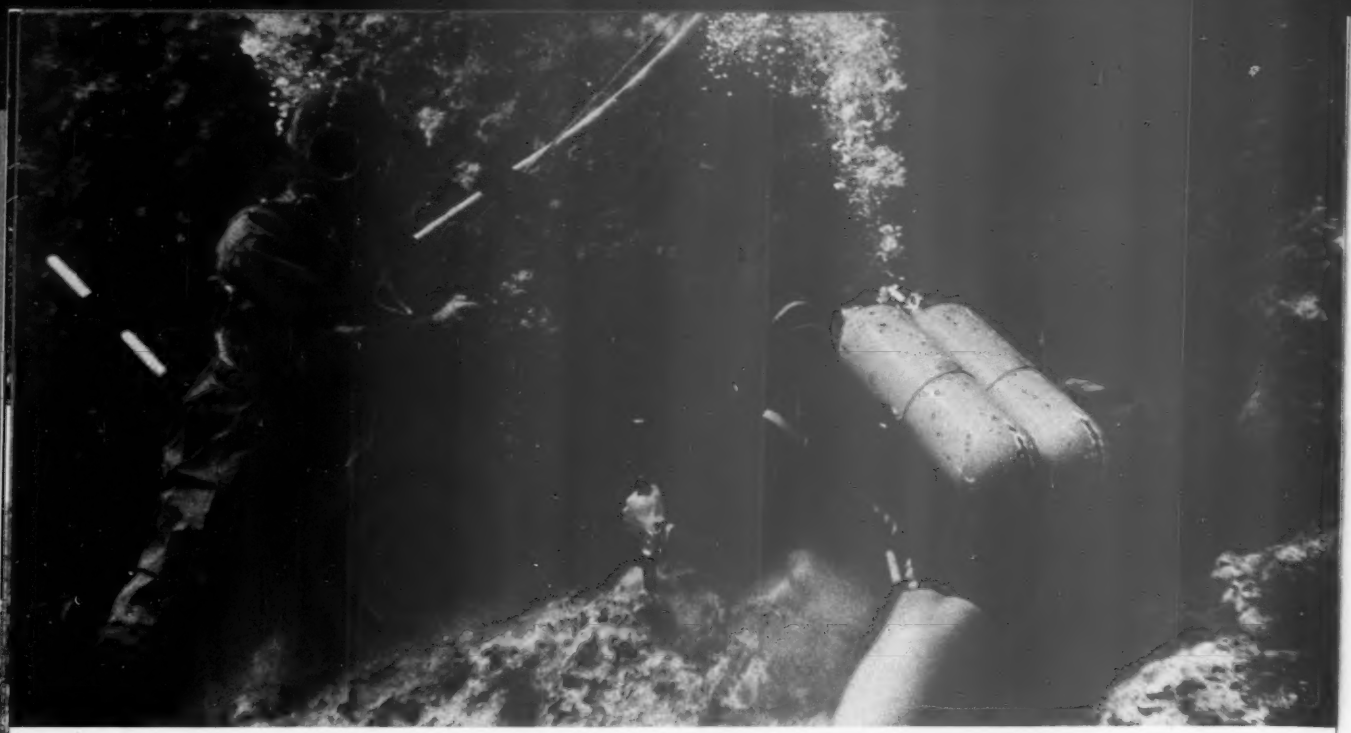
"Found three scarabs . . ."

"Fine Syrian cylinder seal"

Mandalinci's big compressor and we were able to dive in pairs with these, although in the strong current this was sometimes difficult. A twist in a hose could become a kink, cutting off all air at the bottom and, more than once, two of us had to ascend sharing one mouthpiece and the air from one hose. Dangers were not confined to the bottom:

JULY 25, 1960

I left out one other bit of news. I was diving the day that the Seton Lloyds were on the boat (they came down from the British Institute in Ankara for a few days) and Duthuit suddenly appeared and called Dumas and Greer and me to the surface. Nazif, the captain of one of the boats, had caught his finger in a tight cable and cut part of his finger off (it was quite a rough sea while we were working). We started back to the camp and in the distance a fleet of sailboats appeared (a fairly rare sight). Kemal put our flag at half-mast and they returned the signal and sped toward us. It was a group of Bodrum sponge draggers on their way home, and they pulled in like the Sixth Fleet, towed our boat (they are faster) back to camp and we put medicines in and on Nazif and sent him back to Finike with them. Today I saw his finger and he will be able to come back to work now, not



"For about three solid weeks we have done nothing but cut through marble with sledge-hammer and chisels, trying to free the one lump that seems to preserve part of the hull."

"Divers woke with water running under their cots and objects floating by."

losing very much of it. Miss Taylor and Peter had acted very quickly before I got up and had bandaged the wound and stopped the bleeding.

Finds became increasingly exciting:

JULY 30, 1960

Found three scarabs (two faience, one ivory) with hieroglyphic inscriptions, and a polished stone mace-head. Peter spotted them all. The job is running very slowly now as we are trying to get all evidence from the preserved ribs and planks of the ship; the planks show dowel holes. Ryan and Eğdemir are drawing these on the bottom. Am quite pleased with the way things are going on the dig. Have about two hundred numbered objects now, including a bronze spade I hadn't mentioned. It looks now as if we are entering the "captain's cabin" with mace-head, scarabs, many more weights; I expect more.

And:

AUGUST 8, 1960

PLANKS, RIBS, FOURTH SCARAB, MACE-HEAD, CRYSTAL

The "captain's cabin" looked increasingly like living quarters. Along with another scarab, more crystal, and another mace-head, there appeared the only lamp found on the wreck, and evidence of the crew's food—fish bones, olive pits, and a knucklebone from a sheep or goat—concreted under some bronze. Also in this area was a large pile of what may have been firewood: chopped sticks with bark and twigs still attached.

With the increase in finds came a decrease in letters. We were just too busy:

AUGUST 26, 1960

WORK UNFINISHED CABLE IF TWO THREE WEEK LATER TICKET CHANGE POSSIBLE OTHERWISE RETURNING NOW

SEPTEMBER 4, 1960

By now you must have received my cable asking for a delay in my return, and you must wonder why, since there is no news from this end. The reason that there is no news is that for about three solid weeks we have done nothing but cut through marble with sledge-hammer and chisels, trying to free the one lump that seems to preserve part of the hull . . . We dive two at a time, twice a day—the first dive for forty minutes and the second for twenty-five (Lütfi Bey times us and signals when to come up by banging two pieces of metal together just under the surface). The hull is just about ready to come up and that is the reason I wished to stay.

Otherwise, we are terribly tired, never take a day off from diving, the weather is getting colder, part of our cliff came down on the tent the other evening, two of the divers saw a shark, Ann nearly drowned with a faulty regulator and leaking face mask and refuses to dive again (ever!), the current has been fantastic, rice and beans are getting tiresome, the compressor broke again and we have been diving with narghile (hose to surface), and if we have an earthquake or a blizzard I won't be surprised.

A few days later, Nixon Griffis, a recent arrival, Peter and I broke loose the stubborn "hull lump," and raised it to the surface. It was time that the job was finished; machines and divers were wearing down. All that remained of our work was to search the sand for hidden deposits of metal. Just at that time, Luis Marden, of the National Geographic, *paid us a short visit. We were in luck. But I didn't even remember to date my last, short letter.*

FINIKE POST OFFICE

Marden's underwater metal-detector found new bronze—excellent gadget . . . Also, white powder identified by Turyag labs as tin oxide from TIN as I suspected. The captain was making his own bronze as he went with the copper ingots.

The new pieces of bronze were quickly raised. Our job was over. The fall winds had twice sent the waves crashing into our camp. Divers woke with water running under their cots and objects floating by. It was time to leave. With Duthuit giving penicillin shots under a black sky, we loaded our camp onto the boats and left our beach. I wonder if the others are as homesick for that spot as I am now and are as eager as I am to go back this summer?

Footnote on GRIFFINS

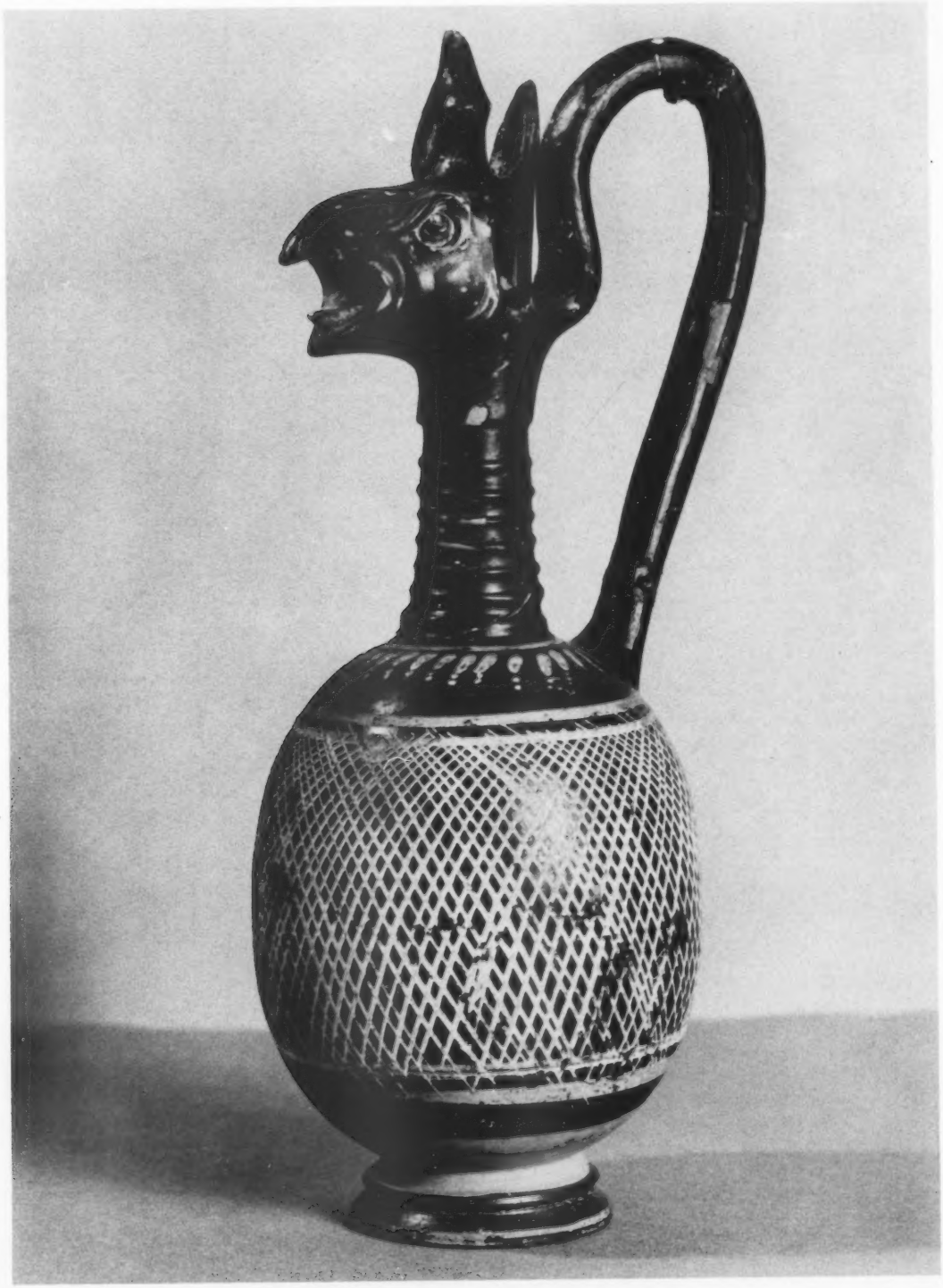
By RODNEY S. YOUNG

Egnatia lay on the Adriatic coast of southern Italy a few miles above Brundisium (Brindisi) and at the point where the direct route from Rome (later the Via Traiana) first met the eastern sea. Perhaps in early times it was an important seaport and a jumping-off place, later supplanted by Brindisi, for voyages across the narrow sea to Dyrrhachium (Durazzo) on the Illyrian coast opposite. In any case, the important Roman road which traversed the Balkan peninsula from the Adriatic to the Bosporos—the Via Egnatia—took its name from the small port on the Italian side.

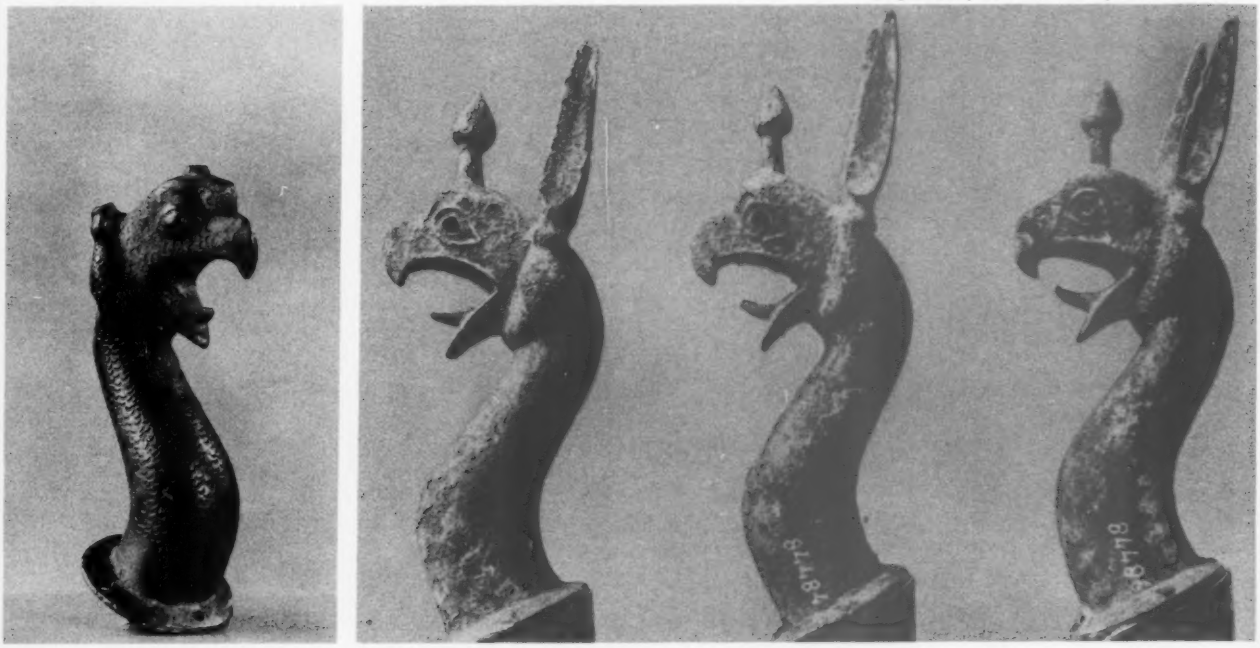
The town has also given its name—though in a corrupted form—to a large class of South Italian pottery which has been found all over Apulia, and which was widely exported. Because vessels of this class were first found in tombs in the district of Egnatia, the fabric was dubbed "Gnathia Ware," though the center of its manufacture was probably at Tarentum. Gnathia Ware flourished throughout the fourth and into the third century before Christ. It is characterized by carefully made vases, usually small, covered with a fine black varnish and decorated with painting over the varnish in white and yellow, sometimes also purple and red. Mostly the decoration is simple and geometric, embellished by garlands and leaves, often with clusters of grapes. The more elaborately painted specimens show birds, theatrical masks, or heads and busts of much-bejewelled ladies. Almost every important museum is liberally endowed with a collection of Gnathia vases, usually without pedigree because they were dug up by tomb robbers in the last century and sold to collectors.

The University Museum possesses its share, but one among these vases is outstanding. This is a jug (L-64-197, a part of the permanent exchange-loan from the Philadelphia Museum of Art) of which the upper part is modelled in the form of a griffin head. The lower part, decorated in white with simple latticing and with a row of jewels at the shoulder, should probably be dated (from its shape as well as its painted ornamentation) to the second half of the fourth century, about 350-300 B.C. The upper part, however, poses a problem. Gnathia vases of plastic form, modelled or moulded, are rare indeed, and a griffin is unique—by the mid-fourth century this beast had been dead for two hundred years. A hybrid of oriental origin, part snake and part bird, the griffin enjoyed a period of great popularity in the Greek world of the seventh and the early sixth centuries; then he disappeared.

Bronze was his proper medium, and many bronze busts (or protomes) of griffins once attached as ornaments at the shoulders of huge bronze cauldrons have come down to us. Such griffin cauldrons were worthy offerings for sanctuary or tomb, and many of the griffin attachments have been found at Delphi and Olympia where they were dedicated, as well as at Praeneste and Vetulonia in Etruria in tombs of the seventh century. The potters of this early period, like the later maker of our Gnathia jug, occasionally tried to imitate the form, but their brittle



Vase of Gnathia Ware in the University Museum



(Left) Bronze griffin head in the University Museum. (Right) Bronze griffin heads from Brolio.

material was not suited to the detail—to the great curving beak and the protruding tongue, to the tall top-knot centered on the head, or to the high upward-pricked ears. Invariably the beaks were shortened and thickened for strength, the top-knots rounded, the ears reduced; the results were much watered-down versions of the fierce bronze originals.

Ulf Jantzen has made a study *(Griechische Greifenkessel)* of the bronze griffin protomes, dividing them into two classes on technical grounds, the hammered and the cast specimens, and into several sub-classes on stylistic grounds. He attributes their manufacture to two main centers, one in the Peloponnese, the other on the island of Samos. From the latter came most of the examples he lists, and their fabrication at Samos seems to be proved by the finding there of an example which was spoiled in the casting. The earliest bronze griffins must date from around 700 B.C., the latest from around 550. Over this period a development may be followed from the short-necked, stubby-eared type with bulging eyes of bronze in the early seventh century, to the serpent-necked, long-eared type with high top-knot and inlaid eyes of the mid-sixth. The Museum possesses a bronze griffin protome of the later type bought by Dr. Hilprecht in Constantinople in 1907 (for twenty francs! 48-2-324), but it has been sadly mutilated, having lost its ears and top-knot and the end of its tongue. Three griffins found at Brolio in Italy better illustrate the type; together with three bronze ibexes they once adorned the same cauldron. It is this type, with alterations dictated by material and the jug form, which reappears on our Gnathia vase two centuries later. The alterations, which include the straightening of the neck, show that the jug was made by free modelling and not by casting in a mould taken from a bronze griffin. Nevertheless the fidelity to the original in style and in detail makes it certain that the potter had before him a proper bronze griffin of the first half of the sixth century while he was making his pottery jug in the second half of the fourth. If he was working at Tarentum, as seems likely, this is quite understandable, for Tarentum was the greatest center of art and industry in southern Italy of the time, noted for its woven goods as well as for its pottery, its terracottas, and its metalwork. Perhaps there, if anywhere, a sixth century griffin attachment could have survived as a studio piece to be admired, to be studied, even to be imitated by the artisans of a later day.

THE RUINS OF ROME

Panini: Ancient Rome

The Metropolitan Museum of Art
Gwynne M. Andrews Fund, 1952

By ROBERT C. SMITH

"Here is to be seen those rare Curiosityes that no Citty in the world can afford the like." Thus Francis Mortoft, like so many other travelers before and since, paid tribute to the Roman ruins in 1659. These ruined temples, palaces, basilicas, and baths, these arches of triumph and "winding pillars," with their statues of gods and emperors, sarcophagi and mural paintings, more than any other monuments of Europe engrossed men's minds and led them to literary and artistic expression.

Panini: The Colosseum and other Monuments

Galleries of the Cranbrook Academy of Art

"Is it but marble that I see?" asked Mrs. Millar in Rome in 1771. The answer of course was no, for she saw the stream of history brought to life in Roman moonlight amongst "the stupendous monuments of past ages," as Petrarch had felt it in the fourteenth century and Montaigne in 1580. With all their connotations, the Ruins of Rome were a constant invitation to moralists to contrast the grandeur of the illustrious past with the decay of the miserable present and to poets they gave a dark but noble theme that flowered in Romanticism. These ruins offered also an endless invitation to admire, to study, to record, and to collect, which has mightily enriched our civilization. From their presence have come the traditions of private and public collecting, the beginnings of archaeology and museology, of travel for the enlightenment of the mind and the formation of taste. They have on a number of occasions inspired a classical style that has affected every aspect of design and in the eighteenth century they brought forth the first original American contributions to academic art. The Ruins of Rome have also called into being a host of drawings, prints and paintings made to record their enduring splendor, many of which are important works of art.

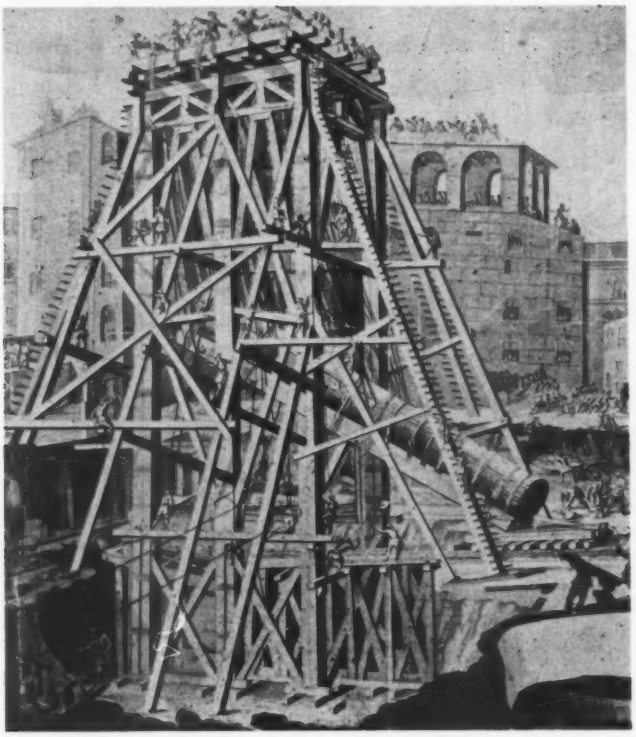
Zuccaro: Sketching the Laocoon

The Rosenbach Foundation

The history of our concept of the Ruins of Rome begins in the twelfth century, when Cardinal Giordano Orsini formed his collection of antique marbles and thereby launched the tradition of the noble collector of ancient art which culminated in the eighteenth century. The original text of the first guide to the ruins of Rome, the *Mirabilia Urbis Romae,* although written for pilgrims to the Christian shrines, expressed respect for pagan architecture.

It was not however until the third quarter of the fifteenth century that the modern concept of the city of Rome as a great museum developed. By this time the classical Renaissance of the Florentine humanists was in full swing. The ruins had been measured by Brunelleschi with a view to bestowing something of their grandeur upon buildings of his time; in Florence ruins had become a fashionable subject for the background of religious paintings; and in Rome itself Sixtus IV in 1471 had created in the Capitoline Palace adjacent to the Forum the first museum of classical antiquities. The Belvedere Museum with its spectacular statues was opened in the Vatican in 1506 and others were established in the gardens of the Cardinals Cesi, Este, and Della Valle.

Here the first travelers who wrote down their impressions of Rome mingled with scholars who had come to study and artists who had come to sketch the statues and decorative reliefs. Some of the finest of these mid-sixteenth century Italian drawings are now in collections in this country, including a sheet of Della Valle marbles attributed to Giorgio Vasari and sketches of scarcophagi which appear to be the work of Girolamo da Carpi. There is also Federico Zuccaro's cartoon for a palace fresco, showing his brother Taddeo sketching the Laocoon in the Belvedere with a glimpse of the Vatican Loggie where Raphael had painted his *grotteschi* decorations in imitation of the antique arabesques found in the ruins of the Golden House of Nero during the excavations of the early Renaissance.



Fontana: Detail of the project of lowering and transporting the Antoninus Pius column

The Cooper Union Museum

Rome was now for the first time since antiquity an international center of art and much of this note taking on the ruins was done by foreign artists for the purpose of publication. In 1544 appeared the first engravings of ancient objects published by the Burgundian Antoine Lafrérie. The Roman drawings of two other Frenchmen, Jean-Jacques Boissard and Etienne Dupérac were later issued in the form of topographical albums including pictorial maps of the Ruins of Rome. In 1576 was published the first monograph on one of these monuments, the illustrated history of the column of Trajan by the Spaniard Alfonso Chacón, which was to be followed by a long series of sumptuous volumes devoted to this, the Colosseum, the triumphal arches, and the catacombs.

Artists in the sixteenth century looked on the Ruins of Rome with respect and awe, making precise and often scholarly sketches that frequently have the value of showing minutely some lost work of art or ruined building since further defaced or, like the Septizonium, totally destroyed. The artists of the seventeenth century treated the Roman ruins with more familiarity. They tended to see them not so much as isolated monuments of the ancient past as integral parts of a landscape which they composed according to formulas that soon became academic. The concept of landscape as a distinct kind of painting, a genre in itself, was a new one, created largely in Rome in the early seventeenth century and in the presence of the ruins. The latter frequently imposed upon these pictures a silent, meditative quality that reflects what one eighteenth century traveler termed the "severe majesty that seems to preside as the genius of the place." Classical landscapes they were called, not only for the ruins and their spirit but also because of the persons in quasi antique dress that often figured in them. The new genre was as much the creation of expatriate Frenchmen, Dutchmen, and Germans as it was of native Italians. Indeed, as the century progressed foreigners dominated this kind of painting.

G. D. Poussin: Classical Roman Landscape

The Lyman Allyn Museum

Nicolas Poussin, who came from Paris to Rome in 1624 and died there in 1665, is recognized as the supreme master of this type of landscape, for to it he brought the spirit of a classical philosopher and a sense of monumental plastic form. Many in the past, however, have preferred the work of his brother-in-law Gaspard Dughet Poussin, who reduced the classical formula to a picturesque routine in his pleasant, easily understood landscapes filled with recognizable ruins and statues of the *genii loci*. This was a very superior kind of tourist painting and the travelers including eighteenth century Americans revered it. "The pale green Gaspard Poussins," wrote Mrs. Piozzi in 1784, "so valuable, so curious . . ."; and when in 1801 an anonymous "Native of Pennsylvania" visited the studio of the Roman engraver Volpato it is not surprising that the artist was found to be making a print of "a fine composition by Gaspard Poussin."

"Nature and Claude" continued Mrs. Piozzi, "content my fancy," for she found in the classical landscapes of Claude Lorrain, the second great French painter who in the seventeenth century made his career among the Ruins of Rome, a freer and more lyric note. Especially is this true of Claude's drawings of column-strewn landscapes outside Rome and the brilliant etchings based upon them. This essentially romantic approach, conventionalized by the Franco-Dutch painter Jan Asselyn, Bartolomaeus Breenbergh, and others, became by the close of the century a rival to the Poussin manner among the Netherlands painters and draftsmen who lived and worked in Via Margutta. Its spirit survived in the eighteenth century in the small, poetic landscapes of the Englishman Richard Wilson and in some of the work of the great French landscapists Claude-Joseph Vernet and Hubert Robert.

Cruyl: The Piazza Colonna
The Cleveland Museum of Art

Apart from these classicizing circles another group of Low Country artists depicted the Forum and other parts of ancient Rome with almost photographic realism and reportorial exactness of detail, using as their model Flemish background scenes of the fifteenth century. Nothing can better illustrate this approach than the brilliantly lighted, meticulously rendered drawings made in the heart of Rome by Lieven Cruyl, a priest from Ghent with notions of architecture. Precisely dated, frequently by month, between 1664 and 1666, Cruyl's views convey a picture of a busy living city filled with ruins quite different from the staged effects of the classicizing painters. Such drawings as these lead directly to the tempera landscapes of the Dutchman Gaspar van Wittel, called in Italian Vanvitelli and Gaspare dagli Occhiali because of the spectacles he wore when working. This transposition of names is not without significance, for it symbolizes the artist's hybrid style. As van Wittel he kept his Dutch respect for realism and deference to detail; but as Vanvitelli he composed with a measure of Italian grace and *brio* the animated figures of his small urban paintings and the sweeping foliage of his drawings of the landscape of the Tiber. In his work the baroque style had its first effective contact with the Ruins of Rome.

Vanvitelli, who lived until 1736, to a large extent created the sprightly *veduta* style of topographical painting which in the eighteenth century took Italy and especially Rome by storm, bringing Italian artists to vie with foreigners in painting views. In this they were influenced, without doubt, by the stream of wealthy travelers, making what Richard Lassel in 1670 had dubbed "the Grand Tour," who were eager to acquire souvenirs of what they had seen. They were also encouraged by the spectacular success of the Cavaliere Giovanni Paolo Panini, who improved the genre of Vanvitelli and made it an ideal vehicle for the portrayal of ruins.

Panini: The Death Leap of Marcus Curtius

Smith College Museum of Art

Panini: The Arch of Titus

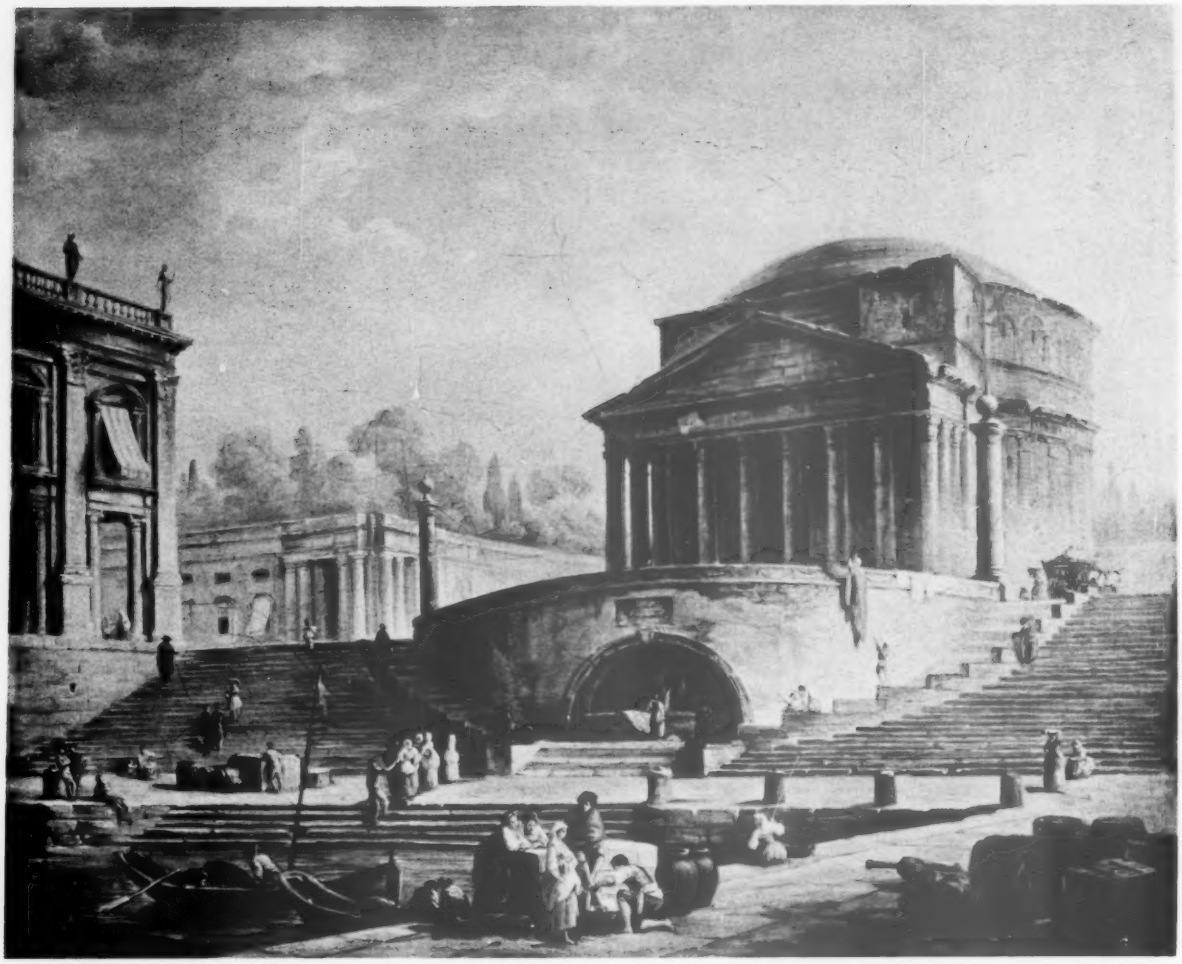
Springfield Museum of Fine Arts

Panini: Apostle Preaching amid Roman Ruins

The William Rockhill Nelson Gallery of Art

Panini: Equestrian Statue in Ruins

Mrs. M. M. P. May



Clérisseau: Classical Landscape

The Art Museum, Princeton University

Born in northern Italy, the home of dramatic baroque architecture and stage design, Panini developed in the 1750's the formula of the *veduta* with ruins. This he did by using larger canvases painted in fresh, clear colors and handsome figures of spectators better drawn than those of Vanvitelli, frequently grouping in arbitrary fashion the most famous ruins of Rome, as the Frenchmen Charles-Michel Challes and Charles-Louis Clérisseau were also to do. Through Panini's drawings, which project the setting of a baroque ballet, recurs the heroic theme of a stately ruined colonnade encasing the equestrian statue of Marcus Aurelius, "the noblest statue in the world," thus repeating the theme of a distinguished German drypoint of 1515 included in the Lessing J. Rosenwald collection. Around this kind of work developed the taste for fantastic ruins, nourished by painters throughout Europe.

Piranesi: A Grotesco

The note of grandeur and the suggestions of past magnificence evoked by the drawings of Panini were stressed by the draftsmen Giuseppe Vasi and Giovanni Battista Piranesi, whose *veduta* prints of Rome are among the best known products of the eighteenth century. Vasi, who recorded some of the great events of his time in Rome, is Panini's counterpart in the field of engraving. Piranesi, on the other hand, ascended to greater heights in the rendering of ruins, which became to generations of romantic Europeans the haunting incarnation of Roman beauty. Piranesi's monumental etchings fixed forever in their minds, as well as in ours, the melancholy elegance of a vine-covered inscription, the majesty of the "orbicular" Pantheon, or the strangely distorted shapes of columns and arches rising in the Forum above ten meters of accumulated dirt. Passionately fond of the Eternal City and its antiquities, Piranesi emerges in his illustrated writings as the advocate of traditional Roman supremacy in classical art and the adversary of the German scholar Johann Joachim Winckelmann, domiciled in Rome, who in 1755 in a celebrated treatise revealed the true superiority of Greek sculpture. The controversy that ensued, in which leading writers and artists took sides, involves another aspect of the cult of Roman ruins in the eighteenth century, the growth of "archaeological" art. "Let no man, who has not formed his taste upon antiquity, take it into his head to act as the connoisseur of beauty." These words of Winckelmann in 1760 define the taste of the new decade and the Classical Revival that was to follow it. They imply that nothing could equal the beauty of classical art and that all modern practice should imitate it. These views were almost universally accepted and from the resulting abdication of creative responsibility certain very definite manifestations were soon apparent.

Robert: The Temple of Love

Wildenstein and Company

We see them in the greater attention now paid to classical costume and physiognomy in painting and sculpture and in the tendency to restore, to "bring to life" the Roman ruins. Thus Benjamin West of Philadelphia after a few years study in Rome will paint in London in 1765 a classical scene as though it were an antique bas-relief and people the background with intact Roman temples as Nicolas and Gaspard Poussin had occasionally done in the seventeenth century. Hubert Robert's *sanguine* drawings mingle actual Roman ruins with well preserved classical halls and cupolas that reflect the growing preoccupation with these majestic themes among the architects of the French Academy in Rome—designs which were subsequently published in Paris and London.

Piranesi: A Plate from Vases Candelabrum

Meanwhile, with the discovery of the buried cities of Herculaneum and Pompeii and the formation of the Albani and other great Roman collections of the eighteenth century, the study and publication of antiquities enormously increased. From 1760 onward Rome, Paris, and London became the three centers of a rapidly developing classical taste in architecture and the decorative arts, which produced the great pattern books of Piranesi, Delafosse, and Robert Adam and later, as archaeological exactitude increased, the plates of Sheraton, Tatham, Roccheggiani, Percier and Fontaine, and Thomas Hope. By 1800 the influence of these publications on the decoration of walls, mantels, furniture, and fabrics was so thorough that there was scarcely a useful or ornamental object which did not in some telling fashion reflect the image of the Ruins of Rome. A similar manifestation of neoclassicism had occurred in the sixteenth century but the revival of the late eighteenth century was a hundred times more thorough.

Copley: Mr. and Mrs. Ralph Izard
Museum of Fine Arts, Boston

Another impact of the Ruins of Rome on eighteenth century art occurred in the field of portraiture. Already in 1670 Lassel had recommended that all travelers to Rome have "a full draught . . . of profane Antiquities" and this suggestion eventually led to the taking of courses with an antiquarian, which generally lasted about six weeks, three hours a day. "I have viewed with enthusiasm classical sites . . . ," wrote James Boswell, as a student of antiquities in Rome in 1765, "I have made a thorough study of architecture, statues and painting; and I believe I have acquired taste to a certain degree." As though to celebrate these tourist activities, Panini painted a decade earlier his *Gallery of Roma Antica,* in which travelers are seen studying a large collection of *vedute* of ruins.

Attributed to Mengs: Cardinal de Bernis

The Walters Art Gallery

In similar spirit the Roman portraitist Pompeo Batoni and his foreign followers in Rome posed their sitters in the midst of ruins or works of ancient art. Thus the French ambassador Cardinal de Bernis, the premier host of Rome in the second half of the eighteenth century, was painted by the German classicist Anton Rafael Mengs, in the presence of the Dioscori and the Apollo Belvedere, that best loved work of art which Tobias Smollett in Rome in 1765 had called "the most beautiful statue that ever was formed." The English painter Nathaniel Dance chose a setting of ruins and sculpture for his conversation piece of about 1762, showing a group of young British Grand Tourists, one of whom, the son of the architect Sir Thomas Robinson, holds an architectural drawing like those in the Roman sketchbooks of Robert Adam and Joseph Wright of Derby. John Singleton Copley of Boston in 1775 showed Ralph Izard of Charleston, South Carolina, American Minister to Tuscany, and his wife sitting in state before the Colosseum beside a well known antique statue and a Grecian vase.

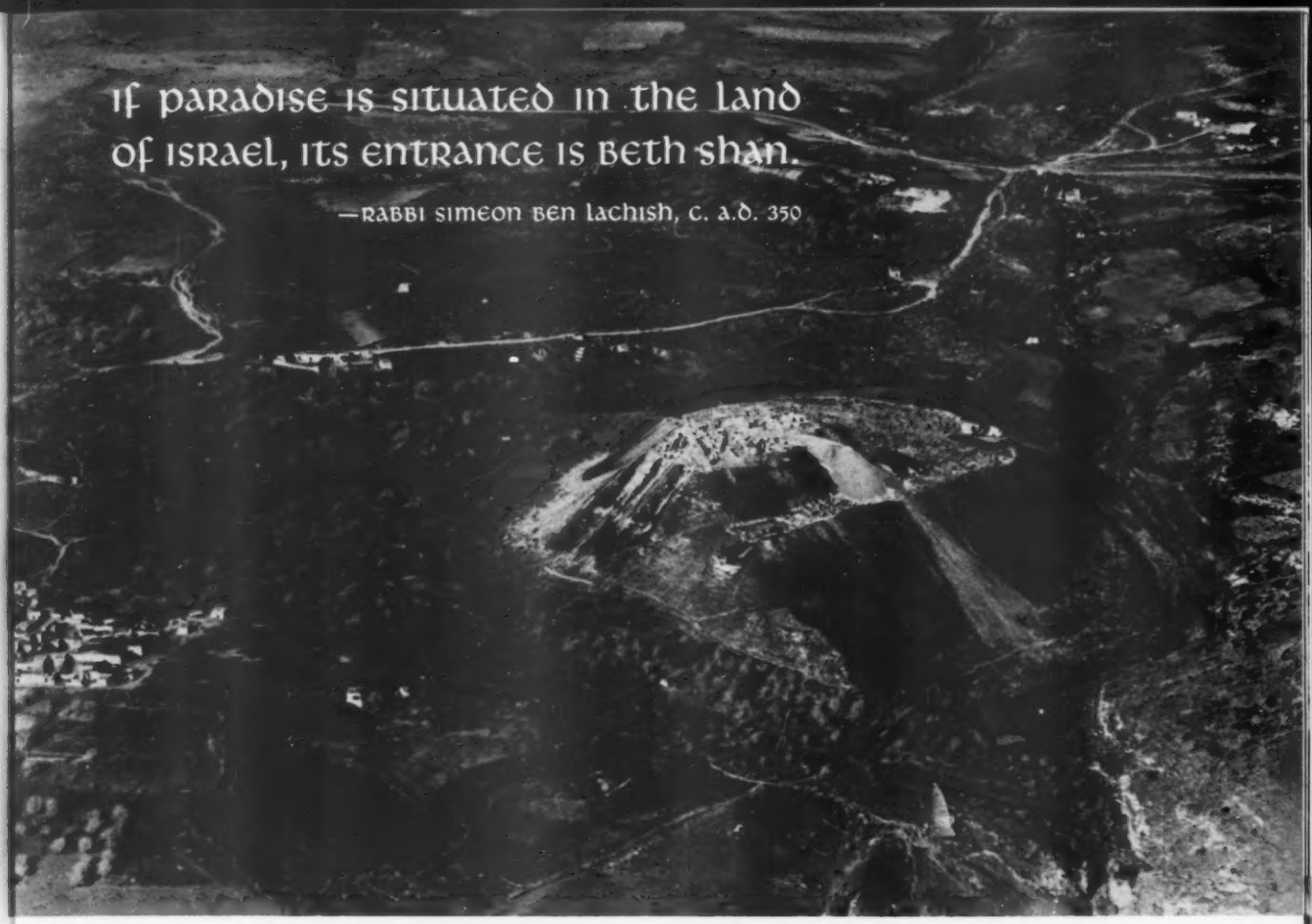
Dance: Conversation Piece

Philadelphia Museum of Art

Some of those who enjoyed what in the sixteenth century had been termed the "English Romayne Lyfe" in the inns around Piazza di Spagna, where British bacon and puddings were always available, returned home with marbles and other antiquities, others with replicas, for as Samuel Sharp reported in 1765, "it is of late become a fashion amongst our Nobility to bespeak copies of statues and pictures from their countrymen," the "good, sober, industrious" English art students resident in Rome.

The English also brought back the new books on the Ruins of Rome by such illustrious antiquarians as Francesco Ficoroni, the chief cicerone of the foreign tourists *("vieux, sourd, parleur impitoyable et fatigant")*, Giovanni Gaetano Bottari, the Vatican librarian, and Ennio Quirino Visconti, the first curator of the Louvre. They purchased the panoramas of Vasi and Piranesi and for them Englishmen like Stephens, Sandby, John Smith, and Domenico Montagu published collections of engraved views. About 1798 appeared Merigot's *Views and Ruins of Rome*, in the peculiarly British form of a handsome folio of aquatints.

By this time, Napoleon had invaded Italy and successfully demanded for Paris the masterpieces of Roman museums, dispersing these treasures and interrupting for a time the tradition of three centuries of contemplating and recording the Ruins of Rome, *"Urbis Eternae Vestigia."* The Forum, forsaken by tourists, the Capitol, Pantheon, and Colisseum, relaxed as it were before the greater onslaughts of the nineteenth century, must in that moment especially have deserved the noble words of Charles de Brosse in 1739, *"Tout y est simple, naturel, auguste, et, par conséquent, sublime!"*



Beth Shan

By FRANCES W. JAMES

The Biblical Book of Samuel tells us that the bodies of Saul and his sons were exposed by the Philistines on the walls of Beth Shan—one of the greatest and most powerful cities of ancient Palestine.

Over three thousand years later and more than three thousand miles away, remains of that very city, including masses of pottery and small objects from the ruins of its houses, and photographs, drawings and plans of its structural remains, are being "re-excavated" in Philadelphia. For three decades the depression of the thirties and the war of the forties have prevented this wealth of materials, uncovered in ten campaign seasons by the University Museum, from telling their full story. Now, hopefully, with a wealth of new comparative materials at hand from post-War excavations in the Near East, the objects of pre-War date are being dusted off and given their chance to add to the fascinating history of Palestine.

Formally known as the University Museum Palestine Expedition, the Beth Shan excavation of the twenties was the result of a deliberate forward-looking policy. This aimed at extending the scope of the Museum's work from Egypt into the relatively unknown area of Palestine as soon after World War I as possible.

Clarence Fisher, then Curator of the Egyptian Section, and Dr. G. B. Gordon, Director of the Museum, made a brief tour through Syro-Palestine in the spring of 1919, and with the flair for *the* site so characteristic of Fisher, unhesitatingly chose Beisan, to use the modern Arab name for the town.

The entire Beisan area, including the "tell," or mound composed of the successive cities which rose here over a period of more than fifty centuries, had been the private property of the Sultan. Here, according to one (unauthenticated)

source, the Sultan was in the habit of sending exiles. But because of its royal ownership "it fulfilled all the conditions of an ideal site, the dream of the archaeologist," according to Fisher. "There were no modern buildings on its summit, not even the inevitable Sheikh's tomb or Moslem cemetery that interferes with the complete exploration of so many Palestinian sites."

In spite of the fact that malaria was rife at Beisan, Fisher immediately staked a claim. In May, 1921, he received the sixth excavation permit issued by the new Department of Antiquities of the British Mandate government, which at the end of World War I replaced the Ottoman regime in Palestine proper.

The original scheme seems to have been to strip the entire tell down to bedrock; and the five uppermost strata *were* removed completely. First came the scrappy remains of an early Arab occupation; then a Byzantine stratum with the ruins of the unique round church which crowned the summit during Beth Shan's flowering in the Early Christian period. Below the church were the remains of a Graeco-Roman temple. This in turn lay over a gateway in the masonry style today associated with buildings of the Hebrew monarchy, and preceding the gateway complex were remains of the latest Canaanite occupation.

Below these completely cleared strata, a large area of each of strata VI-X was excavated, yielding a number of temples and the only Egyptian fortification of the Empire period yet identified anywhere in western Asia. In 1933, the work was ended with a deep sounding to bedrock which produced a series of stratified Early Bronze and Chalcolithic levels. From pits cut in the bedrock came sherds of what is now known as "Jericho Pottery Neolithic B" ware, or ware closely allied to it. At that time no one imagined that this might date from the fifth millennium B.C.

Aside from the excavation on the great tell, approximately one thousand burials in a cemetery on the hill across the River Jalud were also cleared. Most of these graves yielded important objects from the Graeco-Roman period, but a few produced some of the very first archaeological evidence of the Biblical Philistines!

At the time the excavations were in progress it was the Egyptian monuments and the spectacular series of Canaanite temples which won fame for Beth Shan, even in competition with such outstanding contemporary excavations as the Royal Cemetery at Ur and the tomb of Tut-Ankh-Amon. While most of the spectacular items have been dealt with, the bulk of the material still awaits interpretation and publication. Both in turn await funds.

Even so, a small beginning has been made during the past year, using the Markoe Fellowship, in the job of organizing and re-evaluating that part of the collection stored in the University Museum. This initial phase of study is now well under way and has produced a number of important new problems in interpretation.

One fascinating possibility suggested by the preliminary "re-excavation" survey is that an Israelite king may have reconditioned parts of an Egyptian temple complex in erecting the royal storehouses of Beth Shan implied in I Kings, iv!

As it happened, the stratum representing Israelite occupation was at the time of the ex-

cavations somewhat neglected. This was partly because the Israelite buildings were badly cut by the foundations of the heavy Classical buildings overlying them, partly because of a change of directorship just at this point, and partly because the pottery of the period was then little known. However, it is obvious from the recent study that the archaeological record can supplement the Scriptures' scattered references to Israelite activities at Beisan. How long the Hebrew Monarchy retained this geographically critical site guarding the road to Damascus and David's other Syrian possessions is, for example, a much-debated question which could be answered at least in part.

Only slightly less important is the question of the Philistines who for a time vied with the Israelites for possession of Beth Shan. It may be that the strange objects buried with their dead here at Beisan will yield clues enabling us to trace this enigmatic people back to its homeland somewhere in the eastern Mediterranean.

In many ways, Beth Shan has already made major contributions to the background of the Bible. The elucidation of Canaanite religion, for example, which is hinted at in such strong terms in the Bible, but so vaguely described, has always been a strong motive for Palestinian excavation. Yet few, if any, *bona fide* temples had been found before 1925 when the first incredible cult objects began turning up at Beth Shan. Again, by the best of luck, Alan Rowe and G. M. FitzGerald (who took over from Fisher when the latter left to direct the excavation of Megiddo) had chosen to concentrate the work in levels V-X in what proved to have been a sacred area for the three or four centuries immediately preceding the Israelite occupation. From here came not one but six successive temples, with evidence of an astonishing serpent cult.

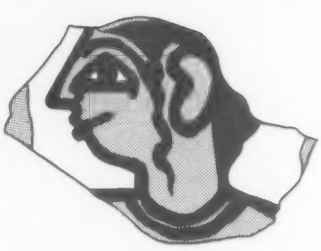
Associated with the temples were Egyptian monuments consisting of stone-cut inscriptions of Seti I and Ramesses II, a statue of Ramesses III, and a number of votive dedications made by Egyptian officials to Canaanite gods. The royal inscriptions, or stelae, detailing military operations in the Beisan area by the two most important 19th dynasty pharaohs were an important addition to Egyptian documentary history.

From the viewpoint of Palestinian archaeology, and therefore of the Bible, even though they slightly precede it in point of time, the stelae were of unique significance and remain so. Their significance lies in the fact that Palestine has ever been so poor a country that few monumental inscriptions occur, and although its people could certainly write, they seem most often to have done so on papyrus. This survives in the dry climate of Egypt, but not in the relative dampness of Palestine. We are thus deprived of such valuable minutiae as merchants' dockets and tax receipts, all likely to provide dating evidence for associated objects and structures.

This lack of written sources for years made Palestinian chronology very difficult. A fairly precise method of ceramic analysis has now been developed by which dates can be satisfactorily determined, but epigraphic evidence naturally is heartily welcomed for the cross check it provides. Hence the heavy basalt stelae from Beisan are almost worth their weight in gold, as their presence makes it possible to date precisely so many objects from Beisan, and, by comparison, objects from many other sites. It is most unfortunate that the depression made impossible the publication of any of the pottery found during the last five excavation seasons, except for a preliminary report on the very early wares of the deep sounding of 1933.

The Hebrew prophets condemned, but rarely elucidated, Canaanite religion. The excavations at Beth Shan proved the existence of an amazing serpent cult there at about 1000 B.C., the temple being packed with terra-cotta cult cylinders some of which had very realistic spotted snakes crawling over them. The one shown here, about eighteen inches high, is one of the smaller cult objects.

Besides thwarting archaeologists in the matter of written records, Palestine also fails to yield information as to what its people looked like, as it is almost completely lacking in sculpture and painting. The written records of Beth Shan, however, are matched with pictures of its residents: Canaanites painted on a pot; Philistines from the faces on their clay copies of Egyptian anthropoid sarcophagi; the people of the Graeco-Roman city from the endearingly crude portrait busts placed in their graves.



Beth Shan appears on the conquest lists of each of the pharaohs mentioned above. The claim of Ramesses III has been doubted, however, as it can be shown that he copied the campaign lists of a predecessor. Some scholars, in any case, suggest that he could never have exerted effective control of so distant a part of western Asia. Beisan, however, has produced a statue of this Ramesses and his cartouche on an important building inscription. Also in Level VI, covering his reign early in the twelfth century B.C., some trouble was taken to stamp the "Egyptian way" on the site. For example, T-shaped stone doorsills with their complementary inscribed door jambs, otherwise unknown in Palestine, occur in a number of buildings assigned to Level VI by the excavators.

Beth Shan also occurs on the conquest lists of Sheshonk, who raided Palestine in the fifth year of Rehoboam, and of Thutmose III, who, in the fifteenth century B.C., conquered the Syro-Palestinian littoral as far north as the Euphrates. The basement "re-excavation" has yielded absolutely no information about Sheshonk's raid, and this is one of the things it is hoped a more detailed study will produce.

The strangest problem raised by the recent survey, however, occurs regarding the town captured by Thutmose. Whether any actual occupation level on the excavated area of the tell can be dated to his reign is doubtful. As has long been recognized, the original dating of the Beth Shan strata was too high, and the so-called Thutmose III level (IX) in reality represents occupation considerably later than the reign of this king. Below IX, Level X appears to date to a fairly early phase of the Middle Bronze Age. It cannot therefore be later than about 1600 B.C. and is probably earlier. While this suggests a gap in occupation, a very little pottery occurs, in a single tomb and in the fill separating Levels IX and X, to suggest continuity. This is the sort of situation which only further pick and spade excavation may be able to settle definitely. While a complete study of the material now at the Museum may also change the picture, on present evidence it appears that the Beth Shan conquered by Thutmose III was at best one of the smallest settlements in the history of the site.

If little has been said about Graeco-Roman Beisan—or Scythopolis as it was known when it was the chief city of the New Testament Decapolis—this is because, like many other towns at this time, it moved from its mound to the plain below. Here it ultimately achieved a circumvallation over two miles around and fine civic

On May 29, 1923, Fisher's cable announced the discovery of stelae of Seti I and Ramesses II (the latter shown here) "establishing" Palestinian history. This claim is almost literally true, as previously discovered records comprise a mere handful of cuneiform tablets.

Well-known pottery of the types used by the Israelites at Beth Shan

buildings, the ruins of which are still visible. Thus, except as represented in the tombs and summit sanctuaries, Scythopolis lay beyond the scope of the Museum excavation. The tombs themselves, however, were very rich in burials of this period. They have produced an enormous quantity of Roman glass and some include a charmingly crude bust of the deceased, so ingenuous as to be true folk art. Similar busts are known elsewhere near Beisan, but not in other parts of Palestine.

The problem of the Scyths, for whom Classical writers tell us Beth Shan was renamed Scythopolis, remains. The Scyths were the *enfants terribles* of the middle of the first millennium B.C. who galloped across the Near East from Assyria to the borders of Egypt, looting and raiding and besieging cities. The artifact usually attributed to them is a three-dimensional, triangular arrowhead. Not one of these occurs at Beisan. Does this mean that the city was never besieged by the Scyths, or that this type of arrowhead is incorrectly associated with them?

It is no small thing to have conceived and carried to a successful conclusion the excavation of such a physically great and archaeologically important site as Beth Shan, and the University Museum can be proud of the foresight which achieved this. Palestine was as archaeologically unexplored in the twenties as is Iran today, where the current Museum excavations are doing much to fill in a gap in knowledge. It is a sobering thought that an excavation of the magnitude of the Beth Shan dig probably could not be repeated today, costs being what they now are.

Though less dramatic, the Beisan results are in every way as brilliant as those of the contemporary excavation of Ur, sponsored by the University Museum in conjunction with the British Museum. What remains is to round off the Beisan achievement in the manner due its significance by tying up loose ends with proper publication, so that these important findings are available to all scholars—whether or not it is possible for them to undertake their own private "excavations" in the Museum basement.

Where in the World?

1

2

3

4

5

6

These pictures are all of sites where the University Museum has worked. Can you select the proper caption for each picture? Answers are on page 44.

The deep well at el-Jib, Jordan, which has been identified as the pool of Gibeon.
Excavations in the Burned Building of the ninth century B.C. at Hasanlu, Iran.
Monuments in process of excavation in the Great Plaza at Tikal, Guatemala.
The city gate at Gordion, Turkey; Persian walls are on top of Phrygian.
The headdress of Queen Shub-ad as found in her tomb at Ur in southern Iraq.
The great stone enclosure at Tiahuanaco, Bolivia; the Gateway of the Sun in background.

THE FLORA OF TIKAL

By C. L. LUNDELL

The popular image of the jungle is one of mystery and romance. Kipling, Conrad, Maugham, and hosts of contemporary and older writers, in creating this common picture, have given the general reader vicarious pleasures of travel and adventure in the fascinating and sometimes menacing jungles of the world.

The towering lowland jungle of Guatemala, lavishly wealthy in flora and fauna, fits perfectly into this popular conception. The elements of romance are there: the mystery of a vanished civilization, ruins of ancient cities, lost temples and ceremonial centers, and buried archaeological treasures—all wrapped in the green gloom of exuberant chlorophyll that has run rampant for almost a thousand years.

The jungle has its beauty, too. The green gloom is brightened with vivid flashes of color in the plumage of tropical birds and the flowers of exotic plants. Patterns, delicate and exquisite, are common to leaves and in the tracery of fronds and foliage in the shifting mosaics of light and shadow. In all fairness, though, we shall note that the jungle is a trap for the uninitiated and the unwary. The jungle has an arsenal of secret weapons with which it scratches, bites, and usually infects. The jungle humidity is oppressive. And the jungle does have an odor!

There is another image of the Guatemala jungle, one much more realistic than the popular image, but one not nearly so generally held: the image of an important segment of the garden of plant creation of the Western Hemisphere.

With the exception of cereal grains, fruits in general, and a few other crops, our most important vegetables, fiber plants, and corn are native to this hemisphere. Apparently, a majority of these had their origin in the region extending from southern Mexico through northern Central America, a region in which Tikal in the lowlands of the Department of Peten, Guatemala, is centrally located.

Roots of trees writhing on the forest floor at Tikal. On the shallow soil, surface roots and buttresses are everywhere evident.

Present theories hold that the movement of mankind into this hemisphere was a southward flow from Siberia through the Bering Strait, down the West Coast all the way to Patagonia. The ancient, migrant Mongolians, or their predecessors, found all the essentials of life in southern Mexico and Central America. They settled there, developed an agriculture and, in time, built the Maya civilization, which rested upon the cornerstone of maize.

Cultivated species of the plants that supported their agriculture eventually passed, probably through barter and trade, to all other areas of the hemisphere. Largely, the plants from this garden of plant creation also made possible the rise of two other great civilizations, the Aztec of Mexico and the Inca of Peru. These elementary facts are mentioned to give background significance to the abundant flora of the region. Today the botanist is able to find relicts of ancient Maya agriculture. He also can find, now and then, wild ancestors of the cultivated species.

The living jungle around Tikal has protected and nurtured cotton, sisal, tobacco, beans, squash, pumpkins, sweet potatoes, peppers, avocados, many fruits, nuts, ornamental relicts,

(Left) Orchids outnumber all other plants in genera and species at Tikal. This is the flower of Epidendrum cochleatum L., *a common epiphyte. (Right) The Peten gourd, a wild ancestor of the pumpkin and cushaw.*

and other plants of economic importance. Here, indeed, is a laboratory of plant creation, where botanists and other plant scientists still can find primordial germ plasm in abundance.

The importance of this source of germ plasm supply to the highly specialized agriculture of North America cannot be overemphasized. Plant breeders continuously are on the lookout for more hardy strains that they can cross with cultivated forms to increase yields and to strengthen drouth tolerance as well as insect and disease resistance.

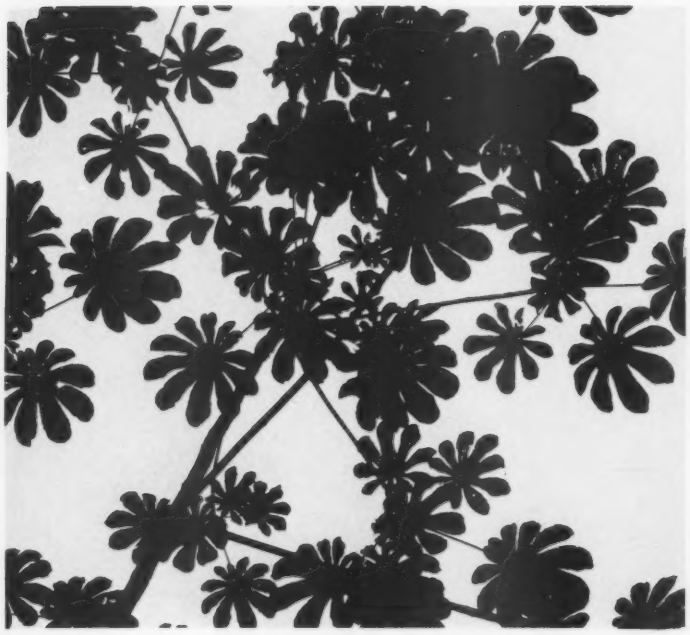
Population expansion of the world and the growing demands which industry is making upon agriculture have plant scientists searching for species that will meet current and future needs of man, whether for antibiotics, fibers, spices, vegetable oils, better proteins, or ornamentals.

All these economic factors contribute to the importance which the Guatemala jungle holds for our basic industry. The Texas Research Foundation is presently engaged in a survey to determine the extent and the variety of the plant resources of the region and to evaluate the ancient Maya agriculture of the Guatemala lowlands. This survey, centered at Tikal and now in its second year, is being undertaken with the financial assistance of The Rockefeller Foundation of New York. It has the gracious cooperation of the Government of Guatemala.

To date, our plant resources survey has recorded more than two thousand species. Progenitors of cultivated plants are being gathered at Tikal for investigation by plant scientists the world over. That, briefly, is a thumbnail validation of the garden image of the Guatemala jungle.

There is still another image, latent but terrible, lurking in Tikal's rank undergrowth and in the grotesque roots that now embrace the selfsame altars where ancient Maya priests fostered their people's faith in their gods of Maize, Sun, Moon, Rain, Earth, and Sky. The image is that of doom —a shattered civilization and the silence of oblivion as the natural and inevitable end for any people, anywhere, who exploit the soil.

That Maya agriculture exploited and exhausted the soil of the region is apparent in giant tree roots writhing and searching for sustenance on the surface of the jungle floor and in the great silt-filled swamps surrounded by low hills which erosion has bared to bedrock. Soil profiles exposed by archaeological excavations show only the thinnest of layers of top soil. This is the once fertile land that in the heyday of Tikal a thousand years ago supported possibly two hundred



Silhouette of a Cecropia *at Tikal*

Jungle patterns in the forest shadows

thousand people. Maya agriculture, surely, was far advanced as a practice—but not as a science.

Basically, Maya civilization rested on corn—or maize—and beans, with corn the staple item of diet. As the Maya had no livestock, they depended upon beans to supply the essential proteins which their European contemporaries were obtaining from dairy products and meats.

The Maya cultivated corn and beans through the milpa system of agriculture, a system of temporary farming in jungle clearings, which after two or more years are abandoned. This is the system found everywhere today in tropical lowland forests. In making these clearings, the Maya left those plants and trees that provided food, fruit, building materials, and other needed products. They cut the trees they did not want and piled brush over the fallen trunks and heavy limbs. Later, usually in April, near the end of the dry season which had reduced the piled brush to inflammable material, they fired the heaps. They then planted corn and beans in the clearings by punching holes in the soil with sharp-pointed and fire-tempered sticks.

Crop yields the first and second years in the new clearings usually were good. By the third year, though, weeds and other quick growing tropical plants had returned in sufficient quantities to sap soil nutrients and drive corn and bean yields below the levels of return essential to population support. The Maya then abandoned the infested clearings, selected new milpa sites in the jungle, and repeated the clearing and burning. Subsequently, of course, they were forced to abandon these sites also. In time, often after a period as short as four or five years, the Maya returned to earlier clearings, once more cut the jungle from them, and repeated the burning and planting.

The essential length of time required for the land to renew itself after each abandonment grew longer and longer, even as the population was increasing and demanding more food. In response, the Maya stepped up the tempo of their losing battle with nature by returning to former clearings before the land had renewed itself. Today at nearby Uaxactun, yields of corn in milpas are often so low the second year that the fields are not harvested. That was true in 1960!

In their desperation, the ancient Maya certainly cut all upland forests in ever-widening and overlapping cycles of cultivation. The inevitable result of such frenzied farming should be apparent even to a disinterested observer. Obvious facts point up precisely the chronology of disaster.

Epiphytes, relatives of the pineapple, on the crown of a forest giant at Tikal. This photograph was taken during the dry season when many of the trees are leafless.

The mute and massive widespread ruins with ramifications of viaducts, roads, other public works, and great temples attest to a teeming, virile population. The tremendous amounts of high protein foods which energized such numbers to such physical labors had to come from the soil, for the Maya had no access to extensive marine products. The tragic results of their efforts to grow these foods are still written in the soil, written so indelibly that the flood of the years has not yet washed away the chronicle.

The Maya milpa system with its continuously losing fight against slowly declining crop yields carried within its operation the seed of its own destruction. The practice of using fire to clear the jungle and brush destroyed all surface litter and much of the humus in the soil. During the thousands of years that the Maya followed this practice, they wrought basic physical and chemical changes in the soil. Continuous cropping and erosion surely depleted the vital supply of soil phosphorus. Under the high annual rainfall, erosion accelerated in the denuded areas, stripping them of top soil and choking the lowland basins with silt.

This distinctive, shifting agriculture of the Maya also depleted the river plains of the Peten of soil nutrients, particularly phosphorus, and destroyed the physical structure so essential to continued production of deep soils. The level lands, including the deltas, probably degenerated more quickly than the hilly terrain where the limestone substrata from which the soil evolved are much nearer the surface.

The image of this man-wrought destruction in the land of the ancient Maya is a specter that haunts the civilized world today. Here is the tragic story of a people who perished through application of the selfsame force through which they achieved greatness.

The ancestors of the Maya came from the North into literally a furnace of plant creation, where they domesticated useful plants and developed an agriculture which, in turn, enabled them to create a magnificent civilization. But their development of an agriculture skipped the one vital step: the practice of soil and water conservation to maintain soil fertility in perpetuity. How could a people as intelligent and as versatile as the Maya obviously were, a people who developed agriculture as far as they did—how could such human beings, creating a highly complex civilization over centuries in time, make such a fatal mistake?

A strangler fig growing on a breadnut tree in the jungle at Tikal

It may be that this mistake provides the answer to the age old riddle, why Tikal and the other great cultural centers of the ancient Maya were abandoned. The faltering of their agricultural economy, basic as it was to Maya civilization, may have coincided with decadence in the social structure, as well as abuses inherent in the narrow dictatorial theocracy which held the culture together. A series of crop failures could have precipitated crises which led to revolution and the final downfall. Although it would not be wise to attribute the disintegration exclusively to a single factor, the failure of Maya agriculture may well have served as the catalytic agent which led to the ultimate crisis in a tired and degenerating culture. Only thus can we account satisfactorily for the almost simultaneous abandonment of such great centers as Tikal and Piedras Negras with their varied physical environment.

Today the wonderful jungle of Tikal has buried all in a serenity of its own, and it is for man to delve into these mysteries.

THE AUTHORS

GEORGE F. BASS ("A Bronze Age Shipwreck") obtained his M. A. from Johns Hopkins University in 1955 and is now working toward his Ph.D. degree in Classical Archaeology at the University of Pennsylvania. His major interest is the prehistoric Aegean. From 1955 to 1957 he was associated with the American School of Classical Studies in Athens; he was a member of the American School's expedition to Lerna in the Peloponnese and of the University Museum's expedition to Gordion. From 1957 to 1959 he was with the U. S. Army in Korea; since then, has been associated with the Museum.

RODNEY S. YOUNG ("Footnote on Griffins"), Curator of the Mediterranean Section of the University Museum since 1949, initiated the excavation of Gordion in 1950. Since that time he has divided his time between his duties in the Museum, teaching in the University of Pennsylvania, and the direction of the Gordion Expedition. In 1953, he headed a reconnaissance expedition for the Museum to Afghanistan. Between 1933 and 1940, Dr. Young was an Agora Fellow, later a Fulbright Fellow, at the American School of Classical Studies in Athens (except for an interlude for Government service during the war), where his particular interest was in the study and publication of Early Iron Age material. He has published numerous articles in his field in *Hesperia* and the *American Journal of Archaeology*.

ROBERT C. SMITH ("The Ruins of Rome") obtained his Ph.D. degree from Harvard University. He is Professor of the History of Art at the University of Pennsylvania and Research Associate at the Henry Francis DuPont Winterthur Museum. He is also Honorary Consultant in Portuguese and Brazilian Studies at the Library of Congress, and is the author of a number of books in this field, including *Franz Frühbeck's Brazilian Journey*, just published by the University of Pennsylvania Press for the Historical Society of America, of which he is a Fellow. Dr. Smith has recently been appointed the first Fulbright Professor in Portugal and, beginning this February, will deliver a series of lectures on the art of the United States and of Portugal at the University and Museum of Fine Arts in Lisbon.

FRANCES W. JAMES ("Beth Shan") entered archaeology as a pick-and-shovel volunteer on blitz sites in London and elsewhere in England where she was stationed as a journalist. She moved on into academic archaeology at London University's Institute of Archaeology, first doing a postgraduate diploma in the archaeology of the Roman Provinces in 1953. After her first season at Jericho, she decided to specialize in Palestinian archaeology and earned a second diploma in that field. She came to the University Museum last spring to cull material from the Beth Shan collection for her doctoral dissertation which will deal with the Israelite levels there.

C. L. LUNDELL ("The Flora of Tikal") has been director and chief botanist of the Texas Research Foundation since 1946. He has done considerable exploration in Central America, where he discovered the Maya cities of Calakmul and Polol. He was director and botanist of the University of Michigan—Carnegie Institution of Washington expedition to Mexico and Central America from 1933 to 1938; in this capacity he made a study of the flora at Uaxactun in the Peten, and for the last three years has been associated with the University Museum expedition to Tikal. He is the author of numerous articles in his field in both scientific and popular publications.

SUGGESTED READING

A BRONZE AGE SHIPWRECK

LIONEL CASSON, The Ancient Mariners. The Macmillan Co., New York. 1959.

PETER THROCKMORTON, Oldest Shipwreck Ever Found, *National Geographic Magazine*, May 1960. Washington.

CAPT. J. Y. COUSTEAU with FREDERIC DUMAS, The Silent World. Harpers, New York. 1953.

PHILIPPE DIOLE, 4000 Years Under the Sea. Pan Books, London. 1957.

BETH SHAN

W. F. ALBRIGHT, The Archaeology of Palestine. Penguin Books, Harmondsworth. 1960.

KATHLEEN KENYON, Archaeology in the Holy Land. Ernest Benn, London. 1960.

Answers to quiz on page 37

1, Tiahuanaco	2, Tikal
3, Hasanlu	4, Ur
5, Gordion	6, el-Jib

Roman art excelled in portraiture. The original of this head of an unknown boy was probably made for a Roman father during the reign of the Emperor Augustus, 29 B.C.—A.D. 14. White. Height 10¼ inches. $6.50 f.o.b. Philadelphia.

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